

SWAMI VEKANANDUNIVERSITY, SIRONJA, SAGAR (M.P.)



SYLLABUS

For

Department of Civil Engineering

Diploma In Cement Technology

Course Code: DCT

Faculty of Engineering

Duration of Course: 3 Year

Examination Mode: Semester

Examination System: Grading

Swami Vivekanand University, Sironja Sagar (M.P.)

2013-2014



Reference Books

1. English Conversation Practice, Grant Taylor.
2. Practical English Grammar, - Thomson & Martinet.
3. Communication Skills for Technical Students Book– I, Book – II, M/S Somaiya Publication, Bombay.
4. Living English Structure, S. Allen.
5. English Grammar, Usage, and Composition, Tickoo & Subramanian, S. Chand & Co. Standard Allen Longman.
6. Essentials of Business Communication, Dr. Rajendra Pal & J.S. Korlahalli S.Chand & Sons, New Delhi.
7. Effective Business Communication, M.V. Rodriques, Concept Pub. Co. New Delhi.
8. Communication for Business, Shirely Taylor, Longman, England.
9. Communication for Engineers and Professors, P. Prasad, S.K.Kataria and sons publications, New Delhi.
10. Technical English Book-II, Somaya Publications, New Delhi.



Physics (DCT-0102)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical				Grand Total (H= D+G)	
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		
						Max (A)	Min	T W (B)	MS T (C)		Ma x (E)	Mi n				
DCT-0102	Physics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

UNITS & MEASUREMENT: Fundamental and derived units, Scalar and vector, Basic requirements to represent vector, Symbols, abbreviation, and proclution, Linear measurement by vernier calipers, screw gauge and spherometer Angular measurement by angular vernier, **MOTION:** Motion and its type, Linear motion (laws and equation), Circular motion, Angular velocity and relation with linear velocity, Centripetal acceleration, Centripetal and Centrifugal forces Rotatory motion, Axis of rotation, Moment of Inertia, Radius of gyration, Kinetic energy of rotation, Numerical Problems and solution on the topic.

UNIT – II

Marks :14

MOLECULAR PHENOMENON OF SOLIDS, LIQUIDS AND GASES: Postulates Of Molecular Kinetic Theory of Structure of Matter, Brownian motion, Kinetic and Potential energy of molecules, Kinetic theory of gases, Postulates, Calculation of pressure by Kinetic theory, Prove of different gases law by Kinetic theory. **PROPERTIES OF MATTER:** Elasticity: Meaning, definition, stress, stain, Hook's law and elastic limit, Surface Tension : Meaning, definition, molecular forces, cohesive and adhesive forces, surface energy, capillary rise and capillary rise method.Viscosity : Meaning, definition, stream line and turbulent flow, critical velocity, Stock's law. Numerical problems and solution on the topic.

UNIT – III

Marks :14

HEAT: Heat and temperature, concept of heat as molecular motion, Transmission of heat, study state and variable state. Concept of heat capacity, specific heat and latent heat. Calorimeter and its uses, Thermodynamics , Relation between heat and work, Mechanical equivalent of heat, First law of thermodynamics and its application, Second law of thermodynamics and its application. Carnot cycle, Numerical problems and solution on the topic. Heating effect of current and thermoelectricity: Heating effect of electric current: Joule's law, work energy and power in electric circuit, calculation of electric energy. Thermo electricity, See back effect and thermoelectric power. Neutral temperature, emperature of inversion and relation between them, Thermo electric thermometer and thermo couples. Numerical problems and solution on the topic.

UNIT – IV

Marks :14

SOUND: Production of sound waves(Longitudinal and transverse waves), Progressive and stationary waves, Basic knowledge of refraction , reflection, interference and diffraction. Ultrasonic, Audible range, Production of ultrasonic, properties and uses, **OPTICS AND OPTICAL INSTRUMENTS:** Refraction, critical angle and total internal reflection, refraction, through lenses and problems, Power of lenses, Spherical and chromatic aberrations, Simple and compound microscope, telescope and derivation for their magnifying power, Numerical problems and solution on the topic.



UNIT – V

Marks :14

ELECTROSTATICS AND ELECTROMAGNETIC INDUCTION: Coulomb's law, Electric field intensity, potential. Capacity, principle of capacitor, types of capacitor, combination of capacitors, Electromagnetic Induction: Faraday's law, Lenz's law, Self and mutual inductance, Transformer and electric motor, Induction coil. **MODERN PHYSICS, BASIC ELECTRONICS:** Photoelectric effect, threshold frequency, Einstein- equation, Photo electric cells, Radioactivity : decay constant, Half life, mean life, Properties of nucleus, nuclear mass, mass defect, Production of x-rays, properties and its uses, Thermal emission, semiconductors, Types of semiconductors, Explanation of conductor, semiconductor and insulators on the basis of band theory, P-N junction, diode as rectifier.

Reference Books

1. Applied Physics Vol. 1 & 2, Saxena and Prabhakar.
2. Physics, - Tti Publication.
3. Physics Vol. 1 &2, Halliday and Resnic R.
4. Engineering Physics, - Gaur and Gupta.
5. Principle of Physics, Brij Lal & Subramanyan.
6. Physics for Technical Education, LS Zednov.

List of Experiments

1. Refractive index of prism (I-d) curve
2. Refractive index of prism (spectrometer)
3. Focal length of a convex lens by u-v method
4. Focal length of a convex lens by displacement method
5. Verification of Ohm's law
6. To find out unknown resistance by meter bridge
7. To find out internal radius of hollow tube by vernier calipers.
8. To find out volume of given cylinder by screw gauge.
9. Surface tension by Capillary rise method.
10. Coefficient of viscosity
11. Coefficient of Thermal conductivity by searl's method.
12. Verification of Newton's cooling law.



Chemistry (DCT-0103)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)			
DCT - 0103	Chemistry	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

ATOMIC STRUCTURE AND RADIOACTIVITY : Discovery of electron, proton, neutron and nucleus. Rutherford's and Bohr's model of atom. Bohr-Bury scheme of filling the electrons in various orbits. Idea of s,p,d,f orbital. Alpha, Gamma and Beta rays, theory of radioactivity, Group displacement law, half life period, numerical problems on half life period, fission and fusion.

SURFACE CHEMISTRY AND ITS APPLICATION: True solution, colloidal solution and suspension, lyophobic and lyophilic colloids, optical and electrical properties of colloids, coagulation, coagulants, idea about gels and emulsions.

ELECTROCHEMISTRY: Electrolysis, Faraday's laws of electrolysis, Numerical problems on Faraday's Law, electroplating of copper and nickel.

COLLIGATIVE PROPERTIES: Osmosis & osmotic pressure, Relative vapour pressure and Raoult's law. Internal energy (enthalpy) Entropy, Entropy function free energy, Effect of change in temperature catalysis.

UNIT – II

Marks :14

CHEMICAL BONDING AND CATALYSIS: Bonding: Nature of bonds- Electrovalent, Covalent, coordinate and hydrogen bond. Catalysis : Types, theory characteristic, positive, negative, auto and induced catalyst. Catalytic Promoter, and catalytic inhibitors. Industrial Application of catalysis.

WATER: Sources of water, types of water, hardness of water, its causes, types and removal, Boiler feed water, harmful - effects of hard water in boiler. Municipal water supply. Numerical on soda lime process. Determination of hardness of water by O. Hender's, EDTA and soap solution method.

UNIT – III

Marks :14

METALS AND ALLOYS : Physical and chemical properties of metals, copper, iron, aluminum, tin, nickel. General principle of metallurgy, minerals/ ores, ore dressing, roasting, smelting, blast furnace, fluxes, purification. Explanation of alloying purposes, methods of alloying, composition and uses of alloy like brass, bronze, duralium, German silver, gun metal, solder, stainless steel, casting and bearing alloy. Ionization, pH value corrosion and protection: Arrhenius theory of ionization, factors affecting ionization. pH meaning (numerical), Buffer solutions and Buffer actions, choice of indicator (acidimetry and alkalimetry). Explanation of corrosion, types of corrosion, factors affecting corrosion, corrosion control (protection against corrosion), metal and organic coating for corrosion control.



UNIT – IV

Marks :14

GLASS, CEMENT AND REFRACTORY: Glass: Basic raw materials for glass, composition and manufacture of glass, varieties of glass and annealing of glass, Cement : Constituting compounds in cement, Composition of Portland Cement, its manufacture, setting and hardening of cement. Refractories : Meaning, characteristics , use of common refractory materials.

HIGH POLYMERS, RUBBER AND INSULATORS: Polymerization and condensation, classification of plastics, Compounding and Moulding constituents of plastics. Preparation Properties and uses of PVC, polyethene, polystyrene, polyamides, polyesters , Bakelite. Synthetic fibers - nylon, rayon, decron, and polyesters. Definition characteristics , classification and properties of insulators. Glass, wool and thermocole. Idea about rubber and vulcanization .

UNIT – V

Marks :14

LUBRICANTS, PAINTS AND VARNISHES: Lubricants: Meaning , type and theory of lubricants, properties of a good lubricants, Flash, and fire point and cloud point, emulsification number, viscosity. Paints and Varnishes : Meaning, ingredients and characteristics of good paints and varnishes, their engineering applications.

FUELS, FIRE EXTINGUISHERS AND EXPLOSIVES : Classification of fuel, gross and net calorific value, Determination of a solid fuel by bomb calorimeter , octane and octane number. Proximate analysis of fuel, its utility, crude petroleum, products of fractional distillation . Fire extinguishers - Description and use. Explosives - Meaning, types, characteristic and use of explosives. Name Dynamite, lead azide, T.N.T., Picric acid, R.D.X. Pollution and control: Introduction and chemical toxicology, air and water pollution, control of air and water pollution. Harmful effect of different gases like carbon mono-oxide, carbon dioxide, sulphur dioxide, nitric oxide, nitrous and lead.

Reference Books

1. Physical Chemistry, Bahl and Tuli
2. Inorganic Chemistry, Satyaprakash
3. Modern Text Book of Applied Chemistry, Dr. G. C. Saxena, Jain Prakashan, Indore
4. Applied Chemistry, Dr. G. C. Saxena, Deepak Prakashan, Gwalior
5. Applied Chemistry, Shrivastava & Singhal, Pbs Publication, Bhopal
6. Engineering Chemistry, Uppal
7. Engineering Chemistry, – Rao And Agarwal
8. Engineering Chemistry, P.C. Jain
9. Polymer Chemistry, O.P. Mishra
10. Applied Chemistry, H.N. Sahni, Deepak Prakash

List of Experiments

1. To identify one Anion and Cation in a given sample.
2. Determination of flash point and fire point of a given sample of oil by Abel's apparatus.
3. Determination of viscosity by Red Wood Viscometer no. 1 and no.2.
4. Redoximetry Titration :
 - a. Percentage of Iron in given sample of alloy.
 - b. Determination of strength of ferrous ammonium sulphate.
 - c. Determination of strength of anhydrous ferrous sulphate and ferrous sulphate.
5. Determination of hardness of water by :
 - a. EDTA Method and Soap Solution Method
6. Determination of solid content in the given sample of water.
7. Determination of percentage of moisture in the given sample of coal by proximate analysis.



Mathematics (DCT-0104)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT - 0104	Mathematics	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I

Marks :14

ALGEBRA: Permutation- Meaning of factorial n, Permutation of 'n' dissimilar thing taken 'r' at a time. Combination Combination of n dissimilar things taken 'r' at a time, Binomial Theorem, Statement of the theorem for positive integer General Term, Middle term, Constant term, Partial Fractions, Define a proper-improper fraction, Break a fraction into partial fraction whose denominator contains Linear, Repeated linear and Non repeated quadratic factors. Determinant, Concept & principles of determinants, Properties of determinant, Simple examples. Complex Numbers, Algebra of Complex

UNIT – II

Marks : 14

TRIGONOMETRY : Allied angles. Trigonometrical ratios of sum and difference of angles, (Only statement), Sum and difference of trigometric ratios (C-D formula), Multiple angles (Only double angle and half angle), Properties of triangle (without proof).
MATRIX : Definition of Matrix. Types of Matrix. Row, Column, Square, Unit, Upper and lower triangular, Symmetric & Skew Symmetric, Singular and non Singular Matrices. Adjoint of a Matrix. Inverse of a Matrix.

UNIT – III

Marks :14

CO-ORDINATE GEOMETRY : Co-ordinate System : Cartesian and Polar. Distance, Division, Area of a triangle. Locus of a point and its equation. Slope of St. Line, Angle between two St. lines. Parallel and perpendicular St. lines. Standard and general equation of St. line. Point of intersection of two st lines.
STATISTICS : Measures of Central tendency (Mean, Mode, Median), Measures of Dispersion (Mean deviation, standard deviation).

UNIT – IV

Marks :14

DIFFERENTIAL CALCULUS : Define constant, variable, function. Value of the function. Concept of limit of a function. Definition and concept of differential coefficient as a limit. Standard results. Derivatives of sum, difference, product, quotient of two functions. Diff coeff. of function of a function. Diff. coeff. of implicit function. Logarithmic Differentiation. Differential coeff. of Parametric function.



UNIT – V

Marks :14

INTEGRAL CALCULUS : Definition as a inverse process of differentiation, Standard Results (including inverse function), Methods of Integration, Substitution, Integration by parts, Breaking up into partial fraction, Concept of Definite Integral.

VECTOR ALGEBRA : Concept of Vector and Scalar Quantities. Different types of vectors. Addition and subtraction of vectors. Components of a vector, Multiplication of two vectors: Scalar Product, Vector Product, Applications (Work done, power & reactive power).

Reference Books

1. Differential Calculus, Gorakh Prasad.
2. Integral Calculus, Gorakh Prasad.
3. Co-ordinate Geometry, S.L. Loni.
4. Engineering Mathematics, Dr. S.K. Chouksey & Manoj Singh.
5. Mathematical Statistics, Ray and Sharma.
6. Higher Engineering Mathematics, B.S. Grewal.



Applied Mechanics (DCT-0201)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory				Practical			Grand Total (H=D+G)			
						End Sem.		Internal		Total (D=A+B+C)	End Sem.			Internal (LW (F))		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				Total (G=E+F)
DCT - 0201	Applied Mechanics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

COMPOSITION AND RESOLUTION OF FORCES

Definition , Effect, characteristics of force, System of Forces, Principle of Transmissibility of Forces, Concept of Resultant Force, Law of –Parallelogram of Forces, Triangle of Forces, Polygon of Forces, Determination of Resultant of two or more concurrent forces (analytically and graphically)

PARALLEL FORCES AND COUPLES

Classification of Parallel Forces, Methods of finding resultant Force of parallel forces- analytically & graphically, Position of resultant force of parallel forces- Definition, Classification and characteristics of a force Couple, moment of couple

UNIT – II

Marks :14

MOMENTS AND THEIR APPLICATIONS

Definition, Types and law of moment-Varignon’s Principle of moment and its applications Lever and its Applications. Types of supports and determination of support reactions of a simply supported beam subjected to point load and uniformly distributed load (UDL).

EQUILIBRIUM OF FORCES

Equilibrium of a system of concurrent forces, Conditions and types of Equilibrium Lami’s Theorem and its applications.

UNIT – III

Marks :14

CENTRE OF GRAVITY

Difference between Centroid and Center of Gravity (CG), Centroid of standard plane figures and CG of simple solid bodies, Method of finding out Centroid of composite plane laminas and cut sections, Method of finding out CG of Composite solid bodies.

FRICTION

Concept and types of friction, Limiting Friction, coefficient of friction, angle of friction, angle of repose, Laws of friction (Static and Kinetic), Analysis of equilibrium of Bodies resting on Horizontal and inclined Plane, Utility / Nuisance value of friction.

UNIT – IV

Marks :14

SIMPLE LIFTING MACHINES

Concept of lifting Machines, Definition of Mechanical Advantage, Velocity Ratio and Efficiency of Machines and their relation Reversibility of Machines and condition for self locking machine, Law of Machines, Maximum mechanical advantage and maximum efficiency of machine, Friction in machine (In terms of Load and effort), Calculation of M.A., V.R. and efficiency of following machines, Simple wheel and axle Differential wheel and axle Single purchase crab Double purchase crab Simple screw jack, Different System of simple pulley blocks.



MOTION OF A PARTICLE

Definition of speed, velocity, acceleration, uniform velocity, uniform acceleration and variable acceleration, Motion under constant acceleration/ retardation (equations of motion) Motion under force of gravity, Concept of relative velocity, Definition of projectile, velocity of projection , angle of projection, time of flight, maximum height, horizontal range and their determination, Definition of angular velocity, angular acceleration and angular displacement, Relation between linear and angular velocity of a particle moving in a circular path, Motion of rotation under constant angular acceleration.

UNIT – V

Marks :14

LAWS OF MOTION

Newton's Laws of motion and their applications.

WORK, POWER AND ENERGY

Definition unit and graphical representation of work, Definition and unit of power and types of engine power and efficiency of an engine. Definition and concept of Impulse, Definition, unit and types of energies, Total energy of a body falling under gravity.

Reference Books

1. A text book of Applied Mechanics – R.S. Khurmi , S.C. Chand & Co. , New Delhi
2. Applied Mechanics – I.B. Prasad, Khanna Publishers, New Delhi
3. Applied Mechanics (Hindi) – R.S. Jog, Anand Publishers, Gwalior Applied

List of Experiments

1. Verification of laws of parallelogram of forces.
2. Verification of laws of polygon of forces
3. Verification of laws of moments
4. Determination of forces in the members of Jib Crane
5. Determination of Centroid of plane lamina by graphical method
6. Determination of coefficient of friction for surfaces of different materials on horizontal plane
7. Determination of coefficient of friction for surfaces of different materials on an inclined plane
Determination of mechanical advantage, velocity ratio and efficiency of the following lifting machines.
8. Simple wheel and axle Differential wheel axle Single purchase crab Double purchase crab Simple pulley block Simple screw jack
9. Measurement of B.H.P. of an engine using rope break dynamometer



Environmental Engineering and Safety (DCT-0202)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT - 0202	Environmental Engineering and Safety	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO ENVIRONMENT.

The Biosphere, biotic and abiotic, An aquatic ecosystem, Types of pollution, Impact of human being on environment, Impact of environment on human being, Basic approach to improve environmental qualities, Roll of an environmental engineer.

AIR POLLUTION SOURCES AND EFFECTS.

Standard definition of air pollution, Composition of natural air, Names of air pollutants, Classification of air pollutants, primary and secondary pollutants, Classification of source of air pollutants on different bases, Definition of different types of aerosols, Effect of air pollution on: human health, material properties, vegetation, Major toxic metals and their effects, Major environmental phenomenon e.g., acid rain, global warming, green house effect, ozone layer depletion, Air quality standards, Brief description of air pollution laws.

UNIT – II

Marks :14

METEOROLOGICAL ASPECTS OF AIR POLLUTANT DISPERSION.

Meteorological parameters influencing air pollution, Environmental laps rate, temperature inversion, atmospheric stability and adiabatic loss rate, Turbulence, topographical effects, Plume behavior, looping, coning, fanning fumigation, lofting , trapping.

AIR POLLUTION CONTROL METHODS AND EQUIPMENTS.

Natural purification processes of air,Artificial purification methods of air, Brief description of following control equipments along with sketch e.g, gravitation settling chamber, cyclone, scrubber, bag house filter, electrostatic precipitator, Brief description of following processes for the control of gaseous pollutants e. g., absorption, adsorption, condensation, combustion etc.

UNIT – III

Marks :14

WATER POLLUTION SOURCES AND CLASSIFICATION.

Water resources, Uses of water, Classification of water,Origin, composition and characteristics of domestic waste water as well as industrial waste water, Biochemical oxygen demand, Water pollution laws and standards, Uses of waste water,Classification of waste water, Chemical oxygen demand.

WASTE WATER TREATMENT METHOD.

basic processes of water treatment. Meaning of primary, secondary and tertiary treatment.Flow chart of a simple effluent treatment plant, Theory of industrial waste treatment,Volume reduction, neutralization and proportioning.



UNIT – IV

Marks :14

SOLID WASTE MANAGEMENT.

Sources and classification of solid waste, Public health aspects, Disposal methods – open dumping , sanitary , land fill. Incineration , composting, Potential methods of disposal, Recovery and recycling of paper, glass, metal and plastic.

NOISE POLLUTION AND CONTROL.

Sources of noise pollution, Units of Noise pollution measurement, Allowable limits for different areas, Problems of noise pollution and measures to control it, Noise pollution control devices brief discussion.

UNIT – V

Marks :14

SAFETY PRACTICES

Responsibility of employees and employers regarding health and safety, Fire hazards ,prevention and precautions, Industrial hazards prevention and protection, Protection from air and noise pollution.

Reference Books

1. Environmental pollution control Engineering by C.S. Rao.
2. Air pollution and control by Seth.
3. Air pollution by M.N Rao.

List of Experiments

GROUP A AIR POLLUTION (Any one experiment may be selected from this group)

1. Air monitoring and determination of SPM , CO, Nox, SO₂ with high volume sampler.
2. Monitoring of stack gases and determination of SPM , CO, Nox, SO₂ with slack monitoring kit.

GROUP B NOISE POLLUTION

3. Determination of sound pollution in (a) Auditorium (b) Factories (c) Busy roads (d) Theatre (e) TV rooms (select any three situations)

GROUP C INDUSTRIAL WASTE WATER (Any Two experiment may be selected from this group)

4. Determination of BOD/COD ratio in industrial waste water.
5. Determination of Ph and alkanity/ acidity in industrial waste water.
6. Determination of solids in industrial

GROUP D POLLUTION STANDARDS(Any Two experiment may be selected from this group)

7. Study of drinking water standards.
8. Study of effluent standards for water disposal.
9. Study of air pollution standards.



Introduction to Computers (DCT-0203)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal (F)			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0203	Introduction to Computers	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO COMPUTERS

Basic Concepts-Generations of Computers Overview of computer Systems Classifications of Computers Characteristics of Computers Applications of Computers. Numbers System & Codes-Decimal, Binary, Octal, Hexadecimal Conversions from one system to other Binary Coded Decimal & ASCII Code. Computer Hardware: Input Devices-KeyBoard, Mouse, Trackball, Joystick, Scanner, OMR OCR Bar-Code Reader, MICR, Digitizer, Card Reader, Voice Recognition, Web Cam, Video Cameras, Etc. Output Devices-Monitors, Printers : Dot matrix, Inkjet & Laser, Plotters, Commuter, Output Micro Film (COM), Multimedia Projector, Speech Synthesizer, Dumb, Smart & Intelligent Terminal.Storage Devices

UNIT – II

Marks :14

Primary and Secondary Storage- Characteristics and Limitation, Floppy, Hard disk, CD ROM DVD, Disk Cartridge. Microprocessor-Registers, Arithmetic Unit, Control Unit, Buses, Instruction Set, Processor Speed.,Memory Concepts. Concept of Memory-Unit of Memory, Types of Memory, RAM,ROM, PROM, EPROM, EEPROM, Cache Memory. Computer Software-System Software Vs Application Software, Operating System Programs, Language Processor, Assembler, Compiler & Interpreter,Application Software, Types of Application Software and their examples., High Level Language, Low Level Language, Assembly Language. Multimedia-Basics of Multimedia,Components- Text, Graphics, Animation, Audio, Images & Video. Multimedia Applications.

UNIT – III

Marks :14

OPERATING SYSTEM

Overview of DOS- Internal Commands, External Commands. Windows Operating System-Overview of different versions of Windows Characteristics and Facilities of Windows, Terminologies of Windows – Desktop, Icon, Menu etc. Components of Desktop. Working with Files and Folders. Windows Utilities and Accessories – Notepad, WordPad, Paintbrush, Windows Explorer, Calculator. Introduction to Linux- An overview of Linux, Basic Linux elements System, Features Software, Features File structure, Linux H/W & S/W requirements.

UNIT – IV

Marks :14

WORD PROCESSING

Saving, Closing, Opening of documents, Selecting text Editing text, Finding and replacing text\ Printing documents, Merge Documents. Character and paragraph Formatting, Page Design and layout. Spell Check, Creating Tables and Charts. Handling Graphics

SPREADSHEET PACKAGE

Spreadsheet concept – Need, advantage, Terminology like cell, row, column etc. Working with



Spreadsheet– Creating, Saving, Editing and printing, Entering data – Entering number, text, date, time etc. Selecting cells – Cut, copy, paste data, Editing Worksheet data. Formatting – Text and Cells, Applying border shading, background patterns, conditional formats, positioning cells, formatting numbers, text, Date, time. Creating formulas- Entering, Editing, Using Functions, Controlling calculations. Working with Charts- Creating charts, Adding & changing text, changing the view and display, types of charts. Presentation Software: Introduction Presentation design tools Presentation terminologies, Creating, Opening and Saving Presentation. Working with different views Creating and Organizing slides, Adding and Formatting text in slides Formatting paragraphs Adding drawings and objects Creating special effects Working with table and charts Printing Presentation.

UNIT – V DATABASE

Marks :14

Introduction – need, Characteristics and terminologies of database, Types of database – relational, Hierarchical and Network. Basic entities – Tables, records, Data types, Data, Validation and constraints, keys relation between tables. Query – Select, Insert, Update, Delete. Forms – Creating forms, Forms controls Report Designer- Customize formats, grouping reports. Computer Communication & Networks: Information Networks- The Technology of Workgroup Computing, Types of network, Network topology. Network components. Data Communication-Introduction to Data Communication, Types of Data, Transmission media. Internet and E-mail- Internet Basics, Websites- Applications, terminologies, naming conventions., Web Browsers- Types, Navigation and tools, E-mail – concept, terminologies, mailing services provider, advantages comparison with Conventional mailing. Search engine – concept, search engine websites, searching methods.

Text Books

1. S . Jaiswal, A First Course in Computers, Golgotha Publication
2. Slotnick, Butterfield, Colantonio and Kopetzky, Computers & Application, C.C. Health & Company
3. Ron Mansfield, The Complete Guide to Microsoft Office Professional, Sybex /BPB Asian Edition
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia

Reference Books

1. Suresh K. Basandra, Computers Today, Galgotia Publication
2. Norton Peter, Inside IBM PC
3. Computer Hardware, Osborne Series
4. Hardware Bible, BPB Publication
5. Learning Windows in 24 Hours, Sam Techmedia
6. Chapman, Understanding windows, BPB Publication



List of Experiments

1. Study of various components of computer like CPU, keyboard, mouse, monitor, printer, CVT and storage devices.
2. Internal and external commands of DOS.
3. Using Windows operating system, study of desktop, control panel, accessories and settings.
4. File management in windows explorer, Study of WordPad, NotePad, PaintBrush, Calculator etc. Study of Linux operating system.
5. Study of MS-word – opening and saving of documents, formatting, editing and spell check, find and replace, printing, merging. Creating Table, Charts and Graphics.
6. Study of Spreadsheet – creating, saving, editing and printing. Entering data, selecting cells, formatting text, applying border shades and backgrounds, creating formulas, creating charts.
7. Study of Power Point – creating, opening, editing and saving of slides. Adding and formatting text, creating, animations, working with images and special effects. Printing presentation.
8. Study of MSAccess– creating, saving, editing and printing of tables. Managing relationships, writing queries e.g. SELECT, UPDATE, DELETE, INSERT. Forms designing and report printing.
9. Study of Web Browser and mailing programs.



Engineering Drawing (DCT-0204)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H=D+G)		
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal (F)			Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT - 0204	Engineering Drawing	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT – I

Marks :14

INTRODUCTION TO DRAWING INSTRUMENTS:

Introduction of drawing instruments, materials and their uses, Applications of minidrafter Applications of compass and divider Applications of French curves and spline Pencils grades and their uses, Designation and sizes of drawing sheet and drawing board.

PLANNING AND LAYOUT OF DRAWING SHEET:

Planning of drawing sheet as per I.S.: 696-1972 (SP 46: 1988). This should include- Margin, Title Block, Zoning, Revision panel, Folding marks, Numbering of sheet.

CONVENTIONAL REPRESENTATION:

Conventional representation of the following as per BIS practice.Common Engineering materials Electrical installations and fittings – Main switches, (lighting and power), socket outlets (3 pin 5AMP, 3pin15AMP), bell, buzzer, loud speaker, Aerial, ceiling fan, exhaust fan, Bracket fan, fan regulator, battery and earth point.

Electronics components- Diode: Zener, varactor, Scotty, step recovery, light emitting diode (LED), PNP and NPN transistors, resistance, capacitor, Inductors (fixed and variable both), IC (8pin and 14pin), SCR, TRIAC, DIAC, UJT, FET, MOSFET, LOGIC GATES.

Sanitary fittings- showerhead, wall lavatory basin, corner Lavatory basin, urinal stall, kitchen sink, Indian type WC, Water closets (Asian pan, urissapan, Anglo-Indian, European)

Building -single and double swing doors and windows.

Mechanical components- Internal and external threads, slotted head, Square end and flat, radial arms and ribs, serrated shaft, splined shaft, Chain wheel, bearing, straight and diamond knurling, Compression and tension spring, leaf spring (with and without eye), Spur and helical gear.

LINES, LETTERING AND DIMENSIONING:

Introduction of type of lines and their applications, Single stroke vertical, inclined letters (capital and lowercase) And numerals. Dimensioning: Elements of dimensioning- dimension line, extension line, arrowhead And leader line. Dimensioning system – Aligned and unidirectional. Dimensioning of Arcs and Circles. Angular Dimensioning.Dimension of counter sunk and counter bore.

UNIT – II

Marks :14

GEOMETRICAL CONSTRUCTIONS AND ENGINEERING CURVES

Divide a line into any number of equal parts by parallel line method, Bisecting of line and angle. Construction of triangles and polygons Introduction of conic sections (curves), Construction of Ellipse by Eccentricity and Concentric circles methods, Construction of Parabola by Eccentricity and Rectangle methods, Construction of Hyperbola by Eccentricity method, Construction of Cycloid, Construction of Involute of circle and polygon, Construction of Archimedian Spiral of any number of convolutions.

SCALES:



Introduction of scales and their applications, Concept of reducing, enlarging and full size scale
Classification of scales – plain, diagonal, vernier, Scale of chord and comparative scales
Definition of R.F. Construction of plain and diagonal scales.

UNIT – III

Marks :14

THEORY OF PROJECTION AND PROJECTION OF POINTS, LINES AND PLANES

Definition of various term associated with theory of projection- Planes of projection, Quadrants, first & third angle projection method, Projection of points in all the four quadrants. Projection of lines parallel to HP and VP both, perpendicular to one plane and parallel to other, Inclined to one plane and parallel to other, knowledge of projection of line inclined to both the plane, (No practice required).

Projection of planes – Perpendicular to HP and VP both, Perpendicular to one plane and parallel to other, Inclined to one plane and perpendicular to other, Knowledge of projection of plane inclined to both the planes.

UNIT – IV

Marks :14

PROJECTIONS OF SOLIDS:

Projection of cylinder, cone, prism and pyramid. Under the conditions :- Axis parallel to HP and VP, Axis perpendicular to HP and parallel to VP, Axis perpendicular to VP and parallel to HP, Axis inclined to HP and parallel to VP, Axis inclined to VP and parallel to HP, Axis inclined to both HP and VP.

SECTION OF SOLIDS AND DEVELOPMENT OF SURFACES:

Section of cone, cylinder, prism and pyramid (Solid resting on its base in the HP i.e. the Axis perpendicular to HP and parallel to VP) in the cases:- Section plane parallel to HP and perpendicular to VP, Section plane parallel to VP and perpendicular to HP, Section plane inclined to HP and perpendicular to VP, Section plane inclined to VP and perpendicular to HP. Drawing True shape of section.

Introduction to development of lateral surface of solids- Cone, Cylinder, Prism and Pyramids (Simple and truncated). Under the condition – solid resting on its base in the HP and axis Perpendicular to HP and parallel to VP. Development of funnel and elbow.

INTERSECTION OF SURFACES

Intersection of following cases – Cylinder to cylinder and Prism to prism (With their axis intersecting and perpendicular to each other.)

UNIT – V

Marks :14

ORTHOGRAPHIC PROJECTIONS & FREE HAND SKETCHING:

Principles of orthographic projections- Identification of necessary views and superfluous view Selection of front view. Preparation of necessary orthographic views of simple objects From given pictorial views. Dimensioning of orthographic views as per standard practice. Free hand sketches of simple objects (Using Pencil, Eraser & Paper only)

ISOMETRIC VIEWS

Concept of isometric projection and isometric view (Isometric Drawing), Construction of isometric scale, Construction of isometric view of polygon and circle, Construction of isometric view of cone, cylinder, prism and pyramids, Construction of isometric view of simple objects from given orthographic views.



Text Books

1. ENGINEERING DRAWING – N.D. Bhatt
2. ENGINEERING DRAWING – R.K. Dhawan
3. ENGINEERING DRAWING – P.S.Gill

Reference Books

1. ENGINEERING DRAWING – P.S.Gill
2. SP: 46-1988 Bureau of Indian standard
3. PRINCIPLES OF ELECTRONICS - Malvino



Workshop Practice (DCT-0205)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	T W (B)	MS T (C)		Ma x (E)	Mi n				
DCT-0205	Workshop Practice	-	-	4	4	-	-	-	-	-	60	18	40	100	100	-

PURPOSE

To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.

INSTRUCTIONAL OBJECTIVES

To familiarize with

1. The basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.
2. The production of simple models in the above trades.

Text Books

1. Gopal, T.V., Kumar, T., and Murali, G., A first course on workshop practice – Theory, practice and work book, Suma Publications, 2005.

Reference Books

1. Kannaiah,P. & Narayanan,K.C. Manual on Workshop Practice, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy, V.S. , First year Engineering Workshop Practice, Ramalinga Publications, Madurai, 1999.

List of Experiments

1. EMPHASIS TO BE LAID ON REAL LIFE APPLICATIONS WHEN FRAMING THE EXERCISES.
2. FITTING
Tools & Equipments – Practice in Filing and Drilling.
Making Vee Joints, Square, dovetail joints, Key Making.
3. CARPENTRY
Tools and Equipments- Planning practice. Making Half Lap, dovetail, Mortise & Tenon joints, a mini model of a single door window frame.
4. SHEET METAL
Tools and equipments - Fabrication of a small cabinet, Rectangular Hopper, etc.
5. WELDING
Tools and equipments - Arc welding of butt joint, Lap Joint, Tee Fillet.



6. Demonstration of Gas welding, TIG & MIG.
SMITHY
Tools and Equipments –Making simple parts like hexagonal headed bolt, chisel.



DCT-0301 PRODUCTION PROCESS

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0301	Production Processes	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT I

MARKS-14

Metrology: Standards of Measurements, Linear and angular instruments; slip gauges, comparators, sine bar, angle gauges, clinometers, tape gauge, screw thread measurements limit gauging, Gauge design; fits and tolerance. Rolling: General description of machines and process;

UNIT II

MARKS-14

Metal cutting : Principles of metal cutting, tool geometry ,Tool life plots , Mach inability, Tool wear ,Cutting force analysis, Cutting tool materials & Cutting fluids ,Economics of metal machining .

UNIT III

MARKS-14

Pattern Making

Pattern and pattern making, pattern allowances; pattern design considerations, core, core boxes, types of patterns. Foundry: molding and core sands and their properties molding machines, centrifugal casting, dye casting

UNIT IV

MARKS-14

Forging

Theory and application of forging processes description; principle of toleration of drop and horizontal forging machines; General principle of designs. Press working: Description and operation of processes, process of shearing, punching, piercing, blanking, trimming, perfecting, notching, lancing, embossing, coining, bending, forging and drawing Press, tool dies, auxiliary equipment, safety devices, stock feeders, scrap cutters, forces,



UNIT V

MARKS-14

Welding

Gas welding, Electric arc welding, A.C. and D.C. welding machines and their characteristics. Flux, Electrodes, Pressure welding, electric resistance welding spot, seam and built welding, submerged arc welding; thermit and TIG & MIG Welding, Brazing Gas cutting.

Recommended Books:

1. Anderson and Tetro; Shop Theory; TMH
2. Kaushik JP; Manufacturing Processes; PHI
3. Bawa; Manufacturing Processes; TMH
4. Rao PN; Manufacturing Tech- Foundry, forming welding; TMH



DCT-0302 FUELS, FURNACES AND PYROMETRY

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam	
		L	T	P		Theory					Practical						
						End Sem.		Internal			End Sem.		Internal				Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)	Total (D = A+B+C)	Max (E)	Min	LW (F)	Grand Total (H = D+G)			
DCT-0302	Fuels, Furnaces And Pyrometry	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs	

UNIT I:

Marks-14

Wood and charcoal, coals, Occurrence and distribution of coals in India, High and low temperature coal carbonization, coke manufacture, pulverized coal.

UNIT II:

Marks-14

Petroleum, its origin and occurrence, distillation of crude, products of distillation. Natural gas, LPG, coal gas, producer gas, water gas, etc. Calorific value of fuels. Nuclear fuels and nuclear reactors.

UNIT III:

Marks-14

General classification of furnaces, study of different types of furnaces. Furnaces and kilns used in ceramic, cement and metallurgical industries.

UNIT IV:

Marks-14

Calculations pertaining to furnaces and kilns. Regenerators, recuperators and waste heat boilers. Study of electric furnaces (resistance, induction, arc, dielectric heating) and heating elements.

UNIT V:

Marks-14

PUMPING

Different temperature measuring devices (resistance and thermoelectric pyrometers), Study of radiation, optical and total radiation pyrometers.



Recommended Books:

1. Glass melting tank furnace – Rudolf Gunthar
2. Fuels, Furnaces and Refractories – O.P. Gupta
3. Pyrometry – W.P. Wood & J.M. Cork
4. Industrial Furnaces – W. Trinks
5. General theory of furnaces – M.A. Glinkov et. al.
6. Modern Furnace Technology – H. Etherington
7. Handbook of Glass manufacture – F.V. Tooley
8. Efficient use of fuels – HMSO – Brime and King.
9. Fuel Technology Himus



DCT-0303 ENGINEERING GEOLOGY

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DCT-0303	Engineering Geology	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT I:

MARKS-14

Introduction and Physical Geology: Objects and scope of geology. The crust and the interior of the earth, origin and age of the earth, Sub-aerial and sub-terrain weathering, denudation and deposition, wind, river, glacial and marine erosion, volcanoes, soil formation, soil profile, geological classification of soil and concept of earthquake Plate-tectonics.

UNIT II

MARKS-14

Mineralogy and Crystallography: Fundamentals of mineralogy, study of common rock forming minerals, ores and minerals of economic importance to civil engineering. Elements of crystallography and introduction to crystal systems.

UNIT III

MARKS-14

(1)**Petrology:** Composition of earth's crust, study of igneous, sedimentary and Metamorphic rocks and their formation, characteristics classification, Rocks of civil engineering importance, (2) Geology of India: Physical features of India, Brief geological history of India, occurrence of important ores and minerals in India.

UNIT IV

MARKS-14

Structural Geology: Structures related to rocks, Dip, , Classification and detailed studies of geological structures i.e. folds, Faults, Joints, Unconformity and their importance in Mining Engineering.



UNIT V

MARKS-14

Applied Geology: Introduction to applied geology and its use in civil engg., properties of rocks, selection of sites for roads, bridges, dams, reservoirs and tunnels. Prevention of engineering structures from seismic shocks, stability of hill sides, water bearing strata, artesian wells.

Recommended Books:

1. Prabin Singh – “Engineering and General Geology”
2. Gulati ; Geotechnical Engineering; TMH
3. P.K. Mukerjee – “ A text Book of Geology”
4. S.K. Garg – “ A text Book of Physical and Engineering Geology

List of Experiment (Expandable)

1. Identification of simple rock forming minerals and important ores.
2. Identification of rock
3. Simple map Exercises.
4. Field Visit / Geological Excursion



DCT-0304 CEMENT & its CHEMISTRY

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS (C)		Max (E)	Min			LW (F)	
DCT-0304	Cement & Its Chemistry	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT I:

MARKS-14

Chemistry of Other raw materials used in Cement Mftg Limestone, High grade, Low grade, feed take grade, Iron ore, Latcite, Bauxite, clay, Gypsum, Fly History of Calcareous Cement and Argillaceous, Selection proportionally Chemical Analysis of each materials related to cement Chemistry of Argillaceous and Calcareous Materials: History of Calcareous Cement and Argillaceous, Selection & proportionally Chemical Analysis.

UNIT II-

MARKS-14

Design of Raw Mix

Low grade, high grade, different methods of raw mix design, L.S.F., S.M., A.M., and their effects. Two, Three, Four Components Designs: Low grade, high grade, additive, clay, their roll in the manufactured of cement, control of LSF, SM, AM, HM, etc. Deletenous components and their effects Effect of adding gypsum :Setting and hardening of Portland cements, Coater in set cement, shrinkage, thermal, creep, expansion of cement.

UNIT III-

MARKS-

14

Different Types of Cements

Ordinary Portland cement, Portland pozzolana cement, slag cement, their properties, composition, physical and chemical evaluation of properties, estimation of pozzolana and slag percentage in cement. Concept of various standards for cement as per ISI, BIS, ISD 9000, STI etc. Manufacture of Cement: Methods of different type of cement manufactures. Their advantages - disadvantages, compound composition of clinkers. C3S, C2S, C3A, C4AF.

UNIT IV-

MARKS-14

Effect of Minerals in Cement Manufacture:

Effect of chlorides, alkalis. P2O5, etc. on cement Calcium and Magnesium Determination: Chemical methods of determination, methods of control.



UNIT V:

MARKS-14

Principle of X ray analyser and method of testing of Raw mix and cement. Principle of spectro photometer General principle of chromatography.

Recommended Books:-

1. Text Book of Physical Chemistry - Puri and Sharma
2. Principles of physical chemistry S. Glastone
3. Inorganic chemistry - Puri and Sharma
4. Text Book of inorganic chemistry - Hughee
5. Text Book of inorganic chemistry - Prussel

Name of experiments:-

1. Determination of Compressive strength.
2. Determination of Insoluble residue.
3. Determination of acidic oxides (So_3 , Sio_2)
4. Determination of Basic oxides (Al_2o_3 , Fe_2o_3 , Cao , Mgo)
5. Determination of setting time.
6. Determination of loss on initiation.



DCT-0305 SURVEYING-I

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DCT-0305	Surveying-I	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit I

MARKS-14

Introduction

Concept of surveying, purpose of surveying, Measurements: linear and angular, units of measurement, instruments used for taking these measurements. Classification of survey based on instruments. Basic principles of surveying. Chain Surveying Purpose of chain surveying, Principles of chain surveying, Equipment used in chain surveying Viz. Chains, tapes, ranging rods, arrows, pegs, cross staffs, Indian optical square their construction and uses. Different operations in chain surveying: Ranging (direct/indirect), Offset (perpendicular/oblique) Chaining (flat and sloping ground) Conducting chain survey over an area. Recording the field data, plotting the chain survey, conventional sign. Obstacles in chain surveying. Errors in chain surveying. Correction for erroneous length of chain, simple problems. Testing and adjustment chain.

Unit II

MARKS-14

Compass Surveying- I

Purpose of compass surveying. Construction and working of prismatic compass. Use of prismatic Compass, Method of setting and taking observations. Concept of following: Meridian - Magnetic, true and arbitrary. Bearing - Magnetic, True and Arbitrary. Whole circle Bearing and Reduced Bearing. Fore and back bearing.

Unit III

MARKS-14

Compass Surveying- II

Local attraction - causes, detection, errors and correction. Problems on local attraction, magnetic declination and calculation of included angles in a compass traverse. Concept of a traverse - Open and closed traverse. Traversing with a prismatic compass. Checks for an open and closed traverse. Plotting of a traverse - by included and deflection angles. Concept of closing error. Adjustment of traverse graphically. Errors in compass surveying.



Testing and adjustment of a prismatic compass. Use of surveyor's compass and its construction details, comparison with prismatic compass.

Unit IV

MARKS-14

Leveling- I

Purpose of leveling, concept of a level surface, horizontal surface, vertical surface, datum, reduced level and bench marks, principle and construction of dumpy and I.O.P. (Tilting) levels. Concepts of line of collimation, axis of the bubble tube, axis of the telescope and vertical axis. Leveling staff. (i) Single piece (ii) Folding (iii) sop with pattern.(iv) Invar precision staff. Temporary adjustment: setting up and leveling, adjusting for parallax of Dumpy and I.O.P. level.

Unit -V

MARKS-14

Leveling- II

Differential leveling concept of back sight, fore sight, intermediate sight, station, change point, height of instrument. Level book and reduction of levels by (a) Height of collimation method and (b) Rise and fall method. Arithmetic checks. Problem on reduction of levels. Fly leveling, check. Leveling and profile leveling (L-section and X-section) Errors in leveling, and precautions to minimize them and permissible limits. Reciprocal leveling. Difficulties in leveling Concept of curvature and refraction, testing and adjustment of dumpy and I.O.P. level. Numerical problems.

Project work

A project work will be assigned to the students by the concerned subject faculty. It will carry 10 marks and will be evaluated by the faculty itself. The topic of the project will be decided by the faculty. The students will work in a group of 3 - 5 on each topic. The topic should be related to the subject taught by the faculty and should have proper utility and importance to enhance his practical skill & knowledge.

Recommended Books:-

1. Arora K.R., Surveying Vol. I & II, Standard Book House, Delhi.
2. Kanetkar T.P., Surveying & Levelling Vol. I & II, Pune Vidyarthi Griha Prakashan, Pune.
3. Basak P.N., Surveying & Leveling, Tata Mc Graw - Hill Publishing Co. Ltd., Delhi.
4. Agarwal G.D., Surveying Vol. I & II, Unitech Publishers, Lucknow.



DCT-0306 SELF STUDY /SEMINAR

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam	
		L	T	P		Theory					Practical						
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	Grand Total (H=D+G)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min					LW (F)
DCT-0306	Self Study / Practical 1 Of Basic Civil (Internal Evaluation)	0	0	2	2	-	-	-	-	-	-	-	-	50	50	50	-

Objective of Self Study: is to induce the student to explore and read technical aspects of his area of interest / hobby or new topics suggested by faculty.

Evaluation will be done by assigned faculty based on report/seminar presentation and viva voice.



DCT-0401 CONCRETE TECHNOLOGY

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical				Grand Total (H= D+G)	
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0401	Concrete Technology	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

Unit I

MARKS-14

Introduction Classification, properties, grades, advantage & disadvantages of concrete, Ingredients of concrete, types of cement, aggregates, water, admixtures,

Unit II

MARKS-14

Properties of Fresh and Hardened Concrete: Introduction, Workability, Testing of concrete, Factors affecting, Rheology of concrete, Compressive & Tensile strength, Stress and strain Characteristics, Shrinkage and temperature effects. Creep of concrete,

UNIT-III

MARKS-14

Basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete, concrete mixes with Surkhi and other Pozzolanic materials.

Unit IV

MARKS-14

Production and Quality Control of Concrete: Production of crushed stone aggregate, batching equipments for production and concreting, curing at different temperatures, Concreting Underwater, hot & cold weather condition, statistical quality control, field control.

Unit V

MARKS-14

Special Concretes: Light weight concrete, ready mix concrete, Vacuum concrete, Ferro cement, Fiber reinforced concrete, Polymer concrete composites, Concrete, Guniting, Rubble concrete, Resin concrete, Prestressed concrete,



Recommended books:

1. Varshney RS; Concrete Technology; Oxford & IBH publishing co.
2. Gambhir ML; Concrete Technology – TMH
3. Sinha SN; Reinforced Concrete Technology; TMH
4. New Building Materials Published by B.M.T.P.C., New Delhi
5. Hand books on Materials & Technology - Published by BMTPC & HUDCO



DCT-0402 THERMODYNAMICS

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DCT-0402	Thermodynamics	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT I

MARKS-14

Basic concepts

Thermodynamics, Property, Equilibrium, State, Process, Cycle, Zeroth law of thermodynamics, statement and significance, concept of an Ideal gas, Gas laws, Avogadro's hypothesis, Heat and work transfer. First law of thermodynamics- Statement of first law of thermodynamics, first law applied to closed system, first law applied to a closed system undergoing a cycle, processes analysis of closed system, flow process, flow energy, steady flow process,

UNIT II

MARKS-14

Second law of thermodynamics, heat engine, heat reservoir, Refrigerator, heat pump, COP, EPR, Available energy, Carnot's theorem, Carnot's cycle, efficiency of Carnot's cycle, statement of second law Reversible and irreversible processes, consequence of second law, Entropy, Entropy change for ideal gas, T-S diagrams, Availability and Irreversibility.

UNIT III

MARKS-14

Real gas, Deviation with ideal gas, Vander-wall's equation, evaluation of its constants, Limitations of the equation. The law of corresponding states Compressibility factor, generalized compressibility chart.

UNIT IV

MARKS-14

Pure Substance, Phase, Phase-transformations, formation of steam, properties of steam, PVT surface, HS, TS, PV, PH, TV diagram, processes of vapor measurement of dryness fraction, Use of steam table and Jollier chart.



UNIT V

MARKS-14

Air standard cycles, Carnot, Otto, Diesel, Dual cycles and there comparison, two stroke and four stroke engines, Brayton cycle, non reactive gas mixture, PVT relationship, mixture of ideal gases, properties of mixture of ideal gases, internal energy,

Recommended Books:

1. P.K.Nag; Engineering Thermodynamics; TMH
2. Van GJ; Thermodynamics; John Wylen.
3. Cengel Y; Thermodynamics; TMH
4. Arora CP; Thermodynamics; TMH

List of Experiments (Pl. expands it):

1. To find mechanical equivalent of heat using Joules apparatus
2. To study working of impulse and reaction steam turbine by models.\
3. To study working of Gas turbines by models and to identify various processes of Brayton Cycle.
4. To calculate COP of vapor compression refrigeration system and to plot on T-s, p-H diagrams.
5. To plot specific fuel consumption versus rpm diagrams for diesel and petrol engines.
6. Theory classes must be supplemented with laboratory classes.



DCT-0403 FUEL TECHNOLOGY

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	T W (B)	MS T (C)		Ma x (E)	Mi n				
DCT-0403	Fuel technology	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

Unit I

MARKS-14

Solid Fuels

Coal & lignite reserves in India, Classifications of coal, washing of Coal, Analysis of Coal, proximate and ultimate analysis.

Unit II

MARKS-14

Coal carbonization

Mechanism of Low temperature carbonization and high temperature carbonization, by product recovery from coke oven; properties of coke coal; grinding, pulverization, briquetting of solid fuels.

Unit III

MARKS-14

Liquid Fuels: Origin of petroleum production, Indian Petroleum resources and their nature, Petroleum processing, distillation, cracking thermal & catalytic, coaking, reforming, Isomerisations, Crude oil classification, Reserves of Hydrocarbon in INDIA, introduction to Petroleum refining & processing, atmospheric & Vacuum crystallization.

Unit IV

MARKS-14

Petroleum product and their utilization, blending of petrol for octane number boosting, Transport fuels: Diesel, Petrol, AVL (Aviation Liquid Fuel), Kerosene, fuel & furnace oil, Testing of petroleum product: Flash Point, pore point, Fire point,



Unit V

MARKS-14

Gaseous fuels: Natural gas, Synthetic gases, their composition & properties, producer gas, Water gas, Coal Gas, LPG, CNG, Hydrogen as a fuel.

Recommended Books:

1. Sarkar S; Fuel and Combustion; Orient Long men Ltd.
2. Gupta OP; Fuel and Combustion; Khana Publication
3. Gary; Refining of Petroleum Technology

List of Experiments:

1. To carry on proximate analysis of the given coal sample.
2. To determine the calorific value of the coal by Bomb-Calorimeter method.
3. To determine the viscosity of the given oil sample by Redwood Viscometer. No. 1 and
4. No. 2
5. To determine the viscosity of a given oil sample by Saybolt viscometer.
6. To determine viscosity of a given coal tar with the help of tar viscometer.
7. To determine the flash and fire points of the given oil sample by Penskey Martin's apparatus..
8. To determine the flash and fire points of the given oil sample by Abel's apparatus.
9. To determine the flash and fire points of the given oil sample by Cleveland apparatus.
10. To determine the carbon residue of the given oil by Conradson method.
11. To determine cloud and pour point of given oil sample (coconut) by cloud and pour point apparatus.
12. To determine the composition of given gas by Orsat apparatus.
- 13.

Note: Each student should perform at least eight experiments out the above list.



DCT-0404 BUILDING CONSTRUCTION

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)			
DCT-0404	Building Construction	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT -I

MARKS-14

Stones

Occurrence, varieties, Characteristics and their testing, uses, quarrying and dressing of stones. Timber: Important timbers, their engineering properties and uses, defects in Timber, seasoning and treatment need for wood substitutes, Alternate materials for shuttering Doors/windows, Partitions and structural members etc. Brick and Tiles: Manufacturing, Characteristics,

UNIT -II

MARKS-14

Advance Construction Materials

Use of fly ash in mortars, concrete, Fly ash bricks, stabilized mud blocks, non-erodible mud plinth, D.P.C. materials, Building materials made by Industrial & agricultural waste, clay products P.V.C. materials, advance materials for flooring, doors & windows, facial material, interiors materials for plumbing, sanitation & electrification.

UNIT III

MARKS-14

Foundation

Type of soils, bearing capacity, soil stabilization and improvement of Bearing capacity, settlement and safe limits. Spread foundations, wall footings, grillage, Foundations well foundation, causes of failure and remedial measures; under reamed piles, Foundation on shrinkable soils, black cotton soil, timbering for trenches, dewatering of Foundations. Hyperbolic paraboloid.



UNIT -IV

MARKS-14

Masonry and Walls

Brick masonry, Bonds, Jointing, Stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and nonload bearing walls. Common defects in construction and their effect on strength and performance of walls, designed Brick masonry, precast stone masonry block, Hollow concrete block, plastering and pointing, white and color washing, distempering,

UNIT -V

MARKS-14

Floors and Roofs

Types, minimum thickness, construction, floor finishes, Flat roofs, RCC jack arch, reinforced brick concrete, solid slab and timber roofs, pitched roofs, false ceiling, Roof coverings, Channel unit, cored unit, Waffle unit, Plank and Joist, Brick panel, L-Panel, Ferrocement roofing units, water proofing .Services:

Recommended Books:

1. Mohan Rai & M.P. Jai Singh; Advance in Building Materials & Construction,.
2. S.C. Rangwala; Engineering Materials
3. Sushil Kumar; Building Construction,

List of Experiments:

1. Tests on Bricks
2. Tests on Aggregates
3. Tests on Cement
4. Determination of compressive strength of concrete with different cement grades.
5. Determination of workability of concrete by slump test
6. Determination of workability by compacting factor apparatus.
7. Determination of workability by Vee Bee consistometer.
8. Nondestructive testing of concrete by Rebound hammer test
9. Nondestructive testing of concrete by ultrasonic Method.
10. Test for the effect of admixtures on the concrete compressive strength
11. Testing of micro concrete
12. Design of concrete mix



DCT-0405 HYDRAULIC & HYDRAULIC MACHINE

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam		
		L	T	P		Theory					Practical							
						End Sem.		Internal			End Sem.		Internal				Total (G = E+F)	Grand Total (H = D+G)
						Max (A)	Min	TW (B)	MS T (C)	Total (D = A+B+C)	Max (E)	Min	LW (F)					
DCT-0405	Hydraulic & Hydraulic Machine	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs		

Unit I

MARKS-14

Properties of Fluids: Fluids : Real fluid, ideal fluid., Fluid Mechanics, Hydraulics, Hydrostatics, Hydro kinematics., Mass density, specific weight, specific gravity, cohesion, adhesion, viscosity, surface tension, capillarity, vapor pressure and compressibility. Hydrostatic Pressure: Pressure, intensity of pressure, pressure head, Pascal's law and its applications. Total pressure, resultant pressure, and centre of pressure

Unit II

MARKS-14

Measurement of Pressure: Atmospheric pressure, gauge pressure, vacuum pressure and absolute pressure. Use of simple manometer, differential manometer and mechanical gauges. Measurement of pressure by manometers and pressure gauges. Fundamental of Fluid Flow, Types of Flow, Steady and unsteady flow, Laminar and turbulent flow Uniform and non-uniform flow. Discharge and continuity equation (flow equation) Types of hydraulic energy. Potential energy, Kinetic energy, Pressure energy Bernoulli's theorem; statement and description (without proof of theorems). Venturimeter (horizontal and inclined)

Unit III

MARKS-14

Flow through Pipes: Definition, laminar and turbulent flow explained through Reynold's Experiment. Reynolds Number, critical velocity and velocity distribution. Head Losses in pipe lines due to friction, sudden expansion and sudden contraction entrance, exit,



Unit IV

MARKS-14

Flow through open channels:

Definition of a channel, uniform flow and open channel flow. Discharge through channels using. (i) Chezy's formula (no derivation) (ii) Manning's formula **most economical sections: (i) Rectangular (ii) Trapezoidal**
Flow Measurements: Measurement of velocity by Pitot tube , Measurement of Discharge by a Notch, Difference between notches and orifices. Discharge formulae for rectangular notch, triangular Notch, trapezoidal notch, and conditions for their use. (With derivation)

Unit V

MARKS-14

HYDRAULIC MACHINE: Reciprocating pumps, Centrifugal pumps, Impulse Turbines, Reaction Turbines, Sketching and description of principles of working of above mentioned machines.

Recommended Books:

1. Fluid Mechanics & Hydraulic Machines
2. Vijay Gupta & Gupta S.K., *Fluid Mech* Delhi.
3. Kapoor J.K., *Hydraulics*, Bharat Bharti
4. *Likhi S.K.*, Hydraulics Laboratory Ma *Delhi*.
5. 1.Garde R.J., *Fluid Mechanics*, New Age International Publishers, New Delhi.
6. 2.Jagdish Lal, *Hydraulics & Hydraulic Machines*, Metropolitan Book Depot, Delhi.



DCT-0407 Seminar / Group Discussion (Internal Assessment)

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam	
		L	T	P		Theory					Practical						
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)			
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)		
DCT-0406	Seminar / Group Discussion (Internal Assessment)	0	0	0	2	-	-	-	-	-	-	-	-	50	50	50	-

Objective of GD and seminar is to improve the MASS COMMUNICATION and CONVINCING/ Understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

Evaluation will be done by assigned faculty based on group discussion and power point Presentation.



DCT-0501 CEMENT TECHNOLOGY – II

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DCT-0501	Cement Technology – II	3	1	-	4	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT I

MARKS:14

Crushing of raw materials, open and closed circuit crushing, construction and working features of different types of crushers, drying – grinding, energy consumption, laws of size reduction and its applications, Types of air separators, pre-homogenization, blending and homogenizing of raw mixes in wet and dry processes

UNIT II

MARKS:14

Clinkerization, rotary kiln design and constructional features, types of refractories applied, installation of refractories, recent advances in cement industries, Principles of operations of preheaters and their structural features, principles of pre-calcination, advantages of pre-calcination, different types of pre-calcinator systems, and their applications.

UNIT III

MARKS:14

Kiln burning: types of burners used for gas, oil and coal fuels, improved burners for coal firing, firing system for coal, Control of primary and secondary air flow rate and temperature, control of flame shapes and length, excess and false air and their effect on fuel consumption, hard and soft burning, process parameters affecting kiln performance and clinker quality. Burning techniques. Instruments for control of kiln operation

UNIT IV

MARKS:14

Clinker coolers: needs of clinker cooling, various types of coolers, effect of cooling on the characteristics of clinker, Grinding of cement: Equipment used, control of fineness, external and internal water cooling of cement grinding media, Dust collection systems: principle of operation, design and constructional features of dust collectors.



UNIT V

MARKS:14

Material handling equipment: elementary idea regarding material handling equipment used in cement industry,
Storage practice in cement plants

Recommended Books:

1. Cement data book – Vol.I, II, III – W.H. Duda, Gmbh Germany.
2. The rotary cement kiln – K.E. Perry, J.J. Wadell, Chemical Public. Co., N.Y. 1972
3. Process technology of cement manufacture – Bauverlag, Gmbh Germany.
4. Cement Engineer's Handbook – Von Ottolabahn, McGraw Hill, N.Y.
5. Cement – Perry

List of experiments:

1. Determination of particle size distribution in cement by sieve analysis
2. Determination of surface area of cement by air permeability
3. Determination of particle size distribution in cement by sedimentation
4. Determination of consistency of cement
5. Determination of initial setting time of cement
6. Determination of final setting time of cement
7. Determination of soundness of cement
8. Determination of compressive strength of cement
9. Technical analysis of cement by flame photometer
10. Estimation of iron content in cement by spectrophotometer
11. Chemical analysis of cement
12. Determination of flexural strength of cement mortar
13. Determination of heat of hydration of cement
14. Hydrophobicity of cement
15. Determination of water of absorption of cement (low pressure perm. Test)
16. Preparation of special cement
17. Effect of clinker milling time on fineness of cement



DCT-0502 MECHANICAL & THERMAL BEHAVIOUR OF MATERIALS

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min			LW (F)	
DCT-0502	Mechanical & Thermal Behavior of Materials	3	1	2	6	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT I

MARKS:14

Physical properties- density, crystallographic density, bulk density, theoretical density, specific gravity, open porosity, density measurements, porosity measurements.

UNIT II

MARKS:14

Mechanical behavior-Elasticity, modulus of elasticity, elastic modulus measurement, strength, theoretical strength, effect of flaw size, pore shape, pore crack combinations, internal pores, pore clusters, inclusions. Strength measurement-Tensile strength, compressive strength, bends strength, biaxial strength, fracture toughness, ductile fracture, brittle fracture, Griffith criteria, hardness, Moh's scale, and indentation techniques.

UNIT III

MARKS:14

Ductile versus brittle behavior, mechanism of plastic deformation, deformation behavior of metals, deformation behavior in ceramics, single crystal, polycrystalline ceramics, elementary idea about mechanical behavior of composites, Viscous deformation in inorganic glasses. Major mechanical properties of polymers-Viscoelastic deformation, elastomers, stress relaxation.



UNIT IV

MARKS:14

Thermal behavior-melting behavior, heat capacity, thermal conductivity, thermal expansion of metals, ceramics, inorganic glasses and organic solids, importance of thermal expansion.

Thermal stresses-due to thermal expansion, due to thermal gradients, resistance to thermal shock and spalling, thermal strengthening, annealing, chemical strengthening. Shot peening. Time, temperature and environmental effects- creep, single crystal creep,

UNIT V

MARKS:16

Polycrystalline creep, creep in non-crystalline solids, effects of composition, stoichiometry and environment. Static fatigue, chemical effects, gas-solid reactions, reduction and other reactions, interactions with water vapor, liquid solid reactions, low and high temperature corrosion, condensed phase corrosion, corrosion in coal combustion environment, mechanically induced effects.

Recommended Books:

1. Modern Ceramic engineering – D.W. Richerson, Marcel-Dekker Inc. 1992
2. Introduction to Materials Science for Engineers – James F. Schakelford, Macmillan publishing Co., 1985
3. Kingery et al-Introduction to Ceramics – W.D. Kingery, John Wiley & Sons, 1976
4. Fundamentals of Ceramics – Barsoum
5. Materials science and Engineering – Van Vlack
6. Materials Science and Engineering – V. Raghvan, Prentice Hall of India Pvt. Ltd.
7. Material Engineering – William D. Callister



DCT-0503 Entrepreneurship & Managerial Accounting

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				LW (F)
DCT-0503	Entrepreneurship & Managerial Accounting	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT – I

MARKS: 14

ENTREPRENEUR: Meaning of Entrepreneur; Functions of an Entrepreneur, Types of Entrepreneur, Intrapreneur - an emerging Class. Concept of Entrepreneurship, Role of entrepreneurs in Economic Development; Entrepreneurship in India; Entrepreneurship – its Barriers. **SMALL SCALE INDUSTRY:** Definition; Characteristics; Need and rationale: Objectives; Scope; role of SSI in Economic Development. Advantages of SSI Steps to start an SSI ; Impact of Liberalization, Privatization, Globalization on S.S.I., Effect of WTO/GATT

UNIT –II

MARKS: 14

INSTITUTIONAL SUPPORT: Need for Institutional support; NSIC, SIDO, SSIB, SSICS, SISI, DICs, TCOs.
UNIT - IV 5 Hours PREPARATION OF PROJECT: Meaning of Project; Project Identification; Project Selection; Project Report; Need and Significance of Report; Contents; formulation;

UNIT –III

MARKS: 14

Fundamentals of Financial Accounting: Definition, Scope and Functions of Accounting, Accounting concepts & conventions, Double entry system – Journal, Journalising. Ledger, Trial Balance, Trading and Profit & Loss Account , Balance Sheet. Problems. Sources of Finance: Shares ;Equity, Preference, Debt Capital, Financial Institutions – Cost of Various sources of financing – concept of capital structure. (Simple description)



UNIT – IV

MARKS: 14

Ratio analysis – Meaning – Standards of Comparison. Profitability Ratios – G.P. Ratio, N.P. Ratio, ROI, EPS, P/E Ratio, Liquidity Ratios – current Ratio, Quick Ratio, Solvency Ratios – Debt equity, Debt – Total funds, Turnover Ratios – Stock Turnover, Debt Turnover, Stock velocity, Debt collection period, Fixed assets turnover, working capital turnover, Simple problems on Ratio analysis.

UNIT – V

MARKS: 14

Cost Accounting: Meaning – Nature and scope of Cost Accounting, Costs – Meaning - Classification : Costing methods- Process and Product . Overheads – Cost Allocation and apportionment. Marginal Costing – Meaning – Marginal cost Statement, Break even Analysis – P/V Ratio, BEP.

SUGGESTED READINGS:

1. Financial Accounting – B S Raman – United Publishers, Mangalore
2. Maheswar SN and Maheswari S.K., Financial Accounting, Vikas Publishing House, Mumbai
3. Pandey I.M., Financial Management, Vikas Publishing House, Mumbai.
4. Khan M. Y and Jain P.K., Financial Management, TMH, New Delhi
5. Maheshwari S.N, Cost and Management Accounting, Vikas Publishing House, Mumbai
6. Jain P.K. and Naraang K.L., Cost Accounting, kalyani Publishers, Mumbai
7. Cost Accounting – Pattanshetti & Palekar – S Chand & Co. Delhi, New Delhi:
8. Entrepreneurial Development – Dr. S. S. Khanka S.Chand & Company Ltd. New Delhi.
9. Dynamics of Entrepreneurial Development & Management - Vasant Desai -Himalaya Publishing House.
10. Entrepreneurship Development - Small Business Enterprises - Poornima M Charantimath - Pearson Education – 2006.



DCT-0504 Renewable Energy System

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical			Grand Total (H= D+G)		
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal			Total (G = E+F)
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0504	Renewable Energy & Resource	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

Unit I

MARKS-14

Solar Radiation: Extra-terrestrial and terrestrial, radiation measuring instrument, radiation measurement and predictions. Solar thermal conversion: Basics, Flat plate collectors-liquid and air type. Theory of flat plate collectors, selective coating, advanced collectors, Concentrators: optical design of concentrators, solar water heater,

Solar photovoltaic: Principle of photovoltaic conversion of solar energy; Technology for fabrication of photovoltaic devices; Applications of solar cells in PV generation systems;

Unit II

MARKS-14

Wind energy characteristics and measurement: Metrology of wind speed distribution, wind speed statistics, Weibull, Rayleigh and Normal distribution, Measurement of wind data, Energy estimation of wind regimes; Wind Energy Conversion: Wind energy conversion principles; General introduction; Types and classification of WECS; Application of wind energy.

Unit III

MARKS-14

Production of biomass, photosynthesis-C3 & C4 plants on biomass production; Biomass resources assessment; Co₂ fixation potential of biomass; Classification of biomass; Physicochemical characteristics of biomass as fuel
Biomass conversion routes: biochemical, Chemical and thermo chemical Biochemical conversion of biomass to energy: anaerobic Digestion, biogas production mechanism, technology, types of digesters, design of



Unit IV

MARKS-14

Small Hydropower Systems: Overview of micro, mini and small hydro system; Hydrology; Elements of turbine; Assessment of hydro power; selection and design criteria of turbines; site selection and civil works; speed and voltage regulation; Investment issue load Management and tariff collection; Distribution and marketing issues.

Ocean Energy: Ocean energy resources, ocean energy routs; Principle of ocean thermal energy conversion system, ocean thermal power plants. Principles of ocean wave energy and Tidal energy conversion.

Unit V

MARKS-14

Geothermal energy:

Origin of geothermal resources, type of geothermal energy deposits, site selection geothermal power plants; Hydrogen Energy: Hydrogen as a source of energy, Hydrogen production and storage. Fuel Cells: Types of fuel cell, fuel cell system and sub-system, Principle of working, basic thermodynamics

References:

1. Kothari, Singal & Rajan; Renewable Energy Sources and Emerging Technologies, PHI Learn
2. Khan, B H, Non Conventional Energy, TMH.
3. Sukhatme and Nayak, Solar Energy, Principles of Thermal Collection and Storage, TMH.
4. Tiwari and Ghosal, Renewable Energy Resources: basic principle & application, Narosa Publisher.

List of Experiments

5. To determine viscosity of a given coal tar with the help of tar viscometer.
6. To determine the flash and fire points of the given oil sample by Penskey Martin's apparatus..
7. To determine the flash and fire points of the given oil sample by Abel's apparatus.
8. To determine the flash and fire points of the given oil sample by Cleveland apparatus.
9. To determine the carbon residue of the given oil by Conradson method.
10. To determine cloud and pour point of given oil sample (coconut) by cloud and pour point apparatus.
11. To determine the composition of given gas by Orsat apparatus.

Note: Each student should perform at least eight experiments out the above list.



DCT-0505 THEORY OF MACHINE

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal		Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min	LW (F)	Grand Total (H=D+G)		
DCT-0505	Theory of Machine	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit I

MARKS-14

Mechanisms and Machines

Mechanism, machine, plane and space mechanisms, kinematic pairs, kinematic chains and their classification, degrees of freedom, Grubler's criterion, kinematic inversions of four bar mechanism and slider crank mechanism, equivalent linkages, pantograph, straight line motion mechanisms, Davis and Ackermann's steering mechanisms, Hooke's joint.

Unit II

MARKS-14

Kinematic analysis of plane mechanisms using graphical and Cartesian vector notations: Planar kinematics of a rigid body, rigid body motion, translation, rotation about a fixed axis, absolute general plane motion. General case of plane motion, relative velocity method, velocity and acceleration analysis, instantaneous center and its application, Kennedy's theorem, relative motion

Unit III

MARKS-14

Gears

Classification of gears, nomenclature, involutes and cycloidal tooth profile properties, synthesis of tooth profile for spur gears, tooth system, conjugate action, velocity of sliding, arc of contact, path of contact, contact ratio

Unit IV

MARKS-14

Cams: Classification of followers and cams, radial cam nomenclature, analysis of follower motion (uniform, modified uniform, simple harmonic, parabolic, cycloidal), pressure angle, radius of curvature, synthesis of cam profile by graphical approach, cams with specified contours Gear Trains: Simple, compound, epicyclic gear trains; determination of gear speeds using vector.

Unit V

MARKS-14



Gyroscopic Action in Machines

angular velocity and acceleration, gyroscopic torque/ couple; gyroscopic effect on naval ships; stability of two and four wheel vehicles, rigid disc at an angle fixed to a rotating shaft

Text Books:-

1. Sharma CS; Purohit K; Theory of Mechanism and Machines; PHI..2 Thomas Bevan; Theory 2.Machines; Pearson/ CBS PUB Delhi.

References:

1. Rattan SS; Theory of machines; TMH
2. Ambekar AG; Mechanism and Machine Theory; PHI.

List of experiments (Expandable)

1. To study all inversions of four-bar mechanisms using models
2. Draw velocity and acceleration polygons of all moving link joints in slider crank mechanism
3. Determination of velocity and acceleration in above using method of graphical differentiation
Grading IVth Semester w.e.f.2011-12
4. To study working of differential gear mechanism.
5. To study working of sun and planet epicycle gear train mechanism using models



DCT-0506 TOUR TRAINING

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical					
						End Sem.		Internal			End Sem.		Internal	Total (G = E+F)		Grand Total (H= D+G)
						Max (A)	Min	TW (B)	MS T (C)	Total (D= A+B+C)	Max (E)	Min	LW (F)			
DCT-0506	Tour Training	0	0	2	2	-	-	-	-	-	30	09	20	50	50	-



DCT-0507 MINOR PROJECT

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical					Grand Total (H= D+G)
						End Sem.		Internal		Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)		
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0507	Minor Project	0	0	2	2	-	-	-	-	-	30	09	20	50	50	-

Each candidate shall work on an approved project of a public building or any other civil engineering work and shall submit design and a set of drawings.

OR

Shall submit a detailed report of experimental work/ software package on any specific problem of importance.



Swami Vivekanand University, Sagar 



DCT-0601 PROCESS CONTROL

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DCT-0601	Process Control	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT I

MARKS:14

BASIC CONCEPTS OF PROCESS CONTROL:

Laplace transform of simple functions, transforms of derivatives, solution of differential equations, inversion by partial fractions.

UNIT II

MARKS:14

Response of first-order systems, physical examples of first-order systems, response of first-order systems in series, higher order systems: Second-order and transportation lag.

UNIT III

MARKS:14

LINEAR CLOSED LOOP SYSTEMS:

Control system, controllers and final control elements, block diagram of a chemical reactor control system, closed-loop transfer functions, transient response of simple control systems, Root locus.

UNIT IV

MARKS:14

STABILITY, FREQUENCY RESPONSE ANALYSES AND DESIGN:

Stability: characteristic equation, Routh-Hurwitz criterion, Root-Locus analysis.

UNIT V

MARKS:14

Frequency response analysis of linear processes, Bode stability criterion, gain and phase margins



Recommended Books:

1. Coughanour D.R., Process system Analysis & Control, 2nd Edn., McGraw Hill, Singapore, 1991
2. Peter Harriott, Process Control, McGraw Hill, New York, 1972
3. George Stephenopoulous, Chemical Process Control, 1st Edn., Prentice Hall of India, New Delhi, 1998



DCT-0602 REFRACTORIES

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D= A+B+C)	End Sem.		Internal	Total (G = E+F)	
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DCT-0602	Refractories	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

UNIT I

MARKS:14

Sintering: Introduction, definition, types of sintering processes, study of driving force, mechanisms, Modes of material transport, topology of solid state sintering, liquid phase sintering and vapor phase sintering, parameters for control of sintering processes, Physical properties of Oxide ceramic materials, Refractory carbides, nitrides, cermets and composite materials.

UNIT II

MARKS:14

High temperature oxide ceramics – magnesia, alumina, zirconia, titania, urania and beryllia. Phase diagrams related to the manufacture of conventional refractory one, two and three-component systems for refractory manufacturing.

UNIT III

MARKS:14

Heat setting and air setting bonding mortar, ramming masses, castables, gunning material, gunning tar mixes, properties of refractories based on microstructure, and of conventional refractories.

UNIT IV

MARKS:14

Blast furnace, design and installation of blast furnace, carbon lining, modification of hot blast for high temperature operation. Basic and acidic open hearth furnaces, soaking pits, reheating furnaces, hot metal mixer, ladles, steel melting furnaces by electricity. Application of refractories for secondary steel making process, continuous casting, VOD and other new process of steel making.



UNIT V

MARKS:14

Refractories in non-ferrous industries, refractories in generation of steam, power, nuclear power production, furnaces used in glass, cokeovens, cement industries, gas production, Chemical and Non-ferrous industries.

REFERENCE BOOKS:

1. Refractories - F.H. Norton
2. Refractories: Properties & application - J.H. Chester
3. Refractories - Kenneth Shaw
4. Monolithic Refractories - W.D. Kingery
5. Refractories - M. L. Mishra
6. Introduction to Ceramics - W. D. Kingery

LIST OF EXPERIMENTS:

1. Preparation of Refractory Samples.
2. Estimation of SiO₂, Al₂O₃, Cr₂O₃, Fe₂O₃, TiO₂, CaO, MgO, Na₂O in refractory material.
3. Determination of Porosity in Refractory material.
4. Determination of Bulk density
5. Determination of true / apparent specific gravity
6. Determination of drying shrinkage of refractory material.
7. Determination of firing shrinkage of refractory material.
8. Determination of Cold Crushing Strength of refractory material.
9. Determination of R.U.L. of refractory material.
10. Determination of Thermal Expansion of refractory material.
11. Determination of Refractoriness (PCE) of refractory material.
12. Determination of Thermal Spalling Resistance of refractory material.
13. Determination of Thermal conductivity of refractory material.
14. Determination of Modulus of Rupture of refractory material.
15. Determination of Reversible Thermal Expansion of refractory material.
16. Determination of Creep Resistance of refractory material.
17. Determination of carbon-monoxide disintegration test for refractory material.
18. Determination of loss on ignition.
19. Determination of adsorbed moisture.
20. Determination of chemically combined water.



Mechanical Measurement & Control DCT-0603

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks										Duration of Theory Exam
		L	T	P		Theory					Practical					
						End Sem.		Internal		Total (D=A+B+C)	End Sem.		Internal	Total (G=E+F)	Grand Total (H=D+G)	
						Max (A)	Min	TW (B)	MS T (C)		Max (E)	Min				
DCT-0603	Mechanical Measurement & Control	3	1	2	6	70	22	10	20	100	30	09	20	50	150	3 Hrs

Unit I

MARKS-14

Basic Concepts of Measurement: General measurement system; Experimental test plan: variables, parameters, noise and interference, replication and repetition; Calibration: Static calibration, dynamic calibration, static sensitivity, range, accuracy, precision and bias errors, sequential and random tests; Presenting data: Rectangular coordinate format, semi-log, full-log formats. Measurement System Behavior: General model for a dynamic measurement system and its special cases: zero order, first order, and second order system, determination of time constant and settling time, phase linearity.

Unit II

MARKS-14

Statistics: Least square regression analysis and data outlier detection; Normal distribution and concept of standard deviation of the mean in finite data set, Uncertainty Analysis: Measurement errors; error sources: calibration, data acquisition, data reduction; Design stage uncertainty analysis; combining elemental errors; Bias & Precision errors; Error propagation, Higher order uncertainty analysis.

Unit III

MARKS-14

Temperature Measurement: Temperature standards, Temperature scales; Thermometry based on thermal expansion: Liquid in glass thermometers, Bimetallic Thermometers; Electrical resistance thermometry: Resistance Temperature Detectors, Thermistors; Thermoelectric Temperature Measurement: Temperature measurement with thermocouples, thermocouple standards. Pressure and Velocity Measurement: Relative pressure scales, pressure reference



instruments, barometer, manometer, deadweight tester, pressure gauges and transducers, total and static pressure measurement in moving fluids Flow measurement: Pressure differential meters: Orifice meter, Venturi meter, rotometer.

Unit IV

MARKS-14

Strain Measurement: Stress and strain, resistance strain gauges, gauge factor, strain gauge electrical circuits, multiple gauge bridge, bridge constant, apparent strain and temperature compensation, bending compensation. Motion, Force and Torque Measurement: Displacement measurement: Potentiometers, Linear variable differential transformers, rotary variable differential transformer; Velocity measurement: moving coil transducers; angular velocity measurement: electromagnetic techniques, stroboscopic measurement; Force measurement: load cells, piezoelectric load cells;

Unit V

MARKS-14

Introduction to control systems: Examples of control systems. Open loop and closed loop control, Mathematical modeling of dynamic systems: Transfer function, impulse response function, block diagram of closed loop system, block diagram reduction, Transient and steady state response analyses: First order systems, unit step and unit impulse response of first order systems, second order systems, unit step and unit impulse response of second order systems, transient response specifications, modeling of mechanical systems, modeling of electrical systems, signal flow graphs, modeling of fluid systems, liquid level systems, hydraulic systems, modeling of thermal systems.

References:

1. Nakra and Chowdhry; Measurement and Control; TMH
2. Figiola RS & Beasley DE; Theory and Design for Mechanical Measurements; 3e John Wiley

Text Books:-

3. Katsuhiko Ogata; Modern Control Engineering, 4e Pearson Education, New Delhi
4. Gopal; Control Systems Principles and Design; Tata McGraw Hill, New Delhi.
5. Backwith and Buck; Mechanical Measurements.
6. Swahney; Metrology and Instrumentation;

List of Experiment (Expandable)(Measurement & control):

- 1- Study of various temperature measuring devices; thermo couple, RTD, gas thermo meters.
- 2- Measuring velocity of fluid flow by Ventura meter/ orifice meter/ pitot-tube.
- 3- Measuring torque and power generated by a prime mover by using pony brake



DCT-0604 INSTRUMENTAL AND CONTROL

Paper / Subject Code	Title of the Paper / Subject	Credit Allotted			Total Credit	Distribution of Marks									Duration of Theory Exam	
		L	T	P		Theory					Practical					
						End Sem.		Internal			Total (D=A+B+C)	End Sem.		Internal		Total (G=E+F)
						Max (A)	Min	TW (B)	MS T (C)	Max (E)		Min	LW (F)			
DCT-0604	Instrumentation & Control	3	1	-	4	70	22	10	20	100	-	-	-	-	100	3 Hrs

UNIT I

MARKS:14

Principles, working and applications of UV-VIS spectrophotometer and flame photometer

UNIT II

MARKS:14

Principles, instrumentation, working and applications of Atomic absorption spectrophotometer and Refractometer

UNIT III

MARKS:14

Principles and applications of potentiometer, pH metry, titrimetry and ion selective electrodes, conductometry. Principles and applications of electrogravimetry and polarography

UNIT IV

MARKS:14

Principles, instrumentation, working and applications of TGA, DTA and DSC, Principles and applications of column, TLC and paper chromatography

UNIT V

MARKS:14

Principles, instrumentation, working and applications of Gas chromatography, Principles, instrumentation, working and applications of XRD and SEM

Recommended Books:

1. Instrumental Methods of Chemical Analysis – G.R. Chatwal & S.K. Anand
2. Instrumental Methods of Analysis – H.H. Willard et al.
3. Instrumental Methods of Chemical Analysis – Galen W. Ewing.